

SECTION 02735

PIPE BURSTING FOR WATER MAINS

PART 1 GENERAL

1.1 DESCRIPTION

- A. Work covered under this section includes furnishing all labor, materials, transportation, and equipment necessary for the replacement of water mains, by means of the installation of a new pipe in place of an existing host conduit utilizing Pipe Bursting. The work includes furnishing all labor, tools and equipment required to perform pipe bursting operation, installing the required equipment at the locations indicated on the drawings to perform the pipe bursting operations, and installing new pipe at the locations indicated on the drawings by pipe bursting methods.

1.2 DEFINITIONS

- A. Pipe bursting is a patented method and the pipe bursting contractor must be licensed. Pipe bursting is a method of replacing water mains by fragmenting the existing host conduit and installing the replacement pipe in its void. The pipe bursting process is accomplished by inserting a solid rod into the existing host conduit, attaching a bursting head to the rod, and retracting the rod, causing the bursting of the host pipe and installation of the new pipe simultaneously. The process involves the use of a non percussive “moling” device, suitably sized to break out the old pipe with a flared plug that bursts the existing sewer pipe.
- B. Host conduit is defined as the existing water main which is to be replaced by pipe bursting methods. The host conduits vary in size.
- C. Replacement pipe is defined as the new inserted pipe to be installed by pipe bursting which replaces the host conduit.

1.3 QUALITY ASSURANCE

- A. The contractor shall be certified by the Pipe Bursting System Manufacturer that such firm is a licensed installer of their system.
- B. The contractor shall also warrant that the equipment used on this Contract, where covered by patents or license agreements is furnished in accordance with such agreements and that the prices included herein cover all applicable royalties and fees in accordance with such license agreements. The Contractor shall defend, indemnify and hold the Government harmless from and against any and all costs, loss, damage or expense arising out of or in any way connected with any claim of infringement of patent, trademark or violation of license agreement.
- C. The pipe manufacturer shall be designated at the time of the bid. Any subsequent change of pipe manufacturer must be approved in writing by the Contracting Officer or designated representative. A record of experience and product information shall be provided by the Contractor at the time of the bid.
- D. The Contractor must have successfully completed 5,000 feet of water main pipe bursting.

1.4 SUBMITTALS

- A. The Contractor shall submit the required data in accordance with Division 1. Submittals shall include, but are not limited to, the following:
 - 1. Qualifications of Pipe Bursting Contractor. The Qualifications of the Pipe Bursting Contractor shall be submitted. These Qualifications shall include detailed descriptions of the following:
 - a. Name, business and email address and telephone number of the Pipe Bursting Contractor.
 - b. Name(s) of key personnel to be directly involved with pipe bursting for this project.
 - c. List of jobs, footage, job description, and contact information for projects used to meet the 5,000 ft. minimum experience requirement.
 - d. The Contractor shall sign and date the information provided and certify that to the extent of his knowledge, the information is true and accurate, and that the supervisory personnel for the pipe bursting method will be directly involved with and used on this project. Substitutions of personnel and/or methods will not be allowed without written authorization of the Contracting Officer.
 - 2. Construction Procedures
 - a. The Contractor shall submit written descriptions of the construction method(s) and equipment to be used, pit dimensions, and location required for equipment and material access.
- B. Submit for review complete working drawings showing details of the proposed method of construction and the sequence of operations to be performed during construction. Show the method of pipe bursting including the pipe bursting system to be used, location of working shafts, including method of excavation, shoring and bracing, and dewatering techniques that are proposed to be used.

PART 2 PRODUCTS

2.1 MATERIALS

- A. The replacement pipe shall be HDPE and shall meet the applicable requirements of AWWA C906. The pipe exterior must be abrasive proof from any cutting, scoring, or roughing which might occur due to broken shards from the host pipe. HDPE Pipe shall have a minimum pressure rating of 200 psi.
- B. Pipe shall be joined by fusion welds as required by the pipe manufacturer.
- C. The pipe shall be homogenous throughout and shall be free of visible cracks, holes, foreign material, blisters or other deleterious faults.

- D. Prior to construction, Contractor shall submit for approval, the manufacturer's specific technical data with complete information on resin, physical properties of pipe and pipe dimensions pertinent to this job. A certificate of "Compliance with Specification" shall be furnished for all materials to be supplied.
- E. Dimension Ratios: The minimum wall thickness of the polyethylene pipe shall meet pipe manufacturers recommendations.
- F. Check for damage on the pipe prior to installation. If there is any abrasion, cuts or gouges deeper than 10% of the wall thickness of the pipe, cut out and repair according to ASTM specification F585.

PART 3 EXECUTION

3.1 PREPARATION

- A. The Contractor shall provide temporary bypassing service as required in Division 1 to perform the work.
- B. If the pipe bursting tool and the replacement pipe is to traverse any existing structure which is to remain in place without interruptions during the pipe bursting operation, the conduit entrances and exits to the existing structure shall be opened out to the required dimensions.

3.2 PIPE BURSTING OPERATIONS

- A. The Contractor shall carry out operations in strict accordance with all applicable OSHA, local, and state safety standards.
- B. Pit locations shall be at bends. Should the Contractor want to relocate any pit, the Contractor shall request approval from the Contracting Officer.

C. PIPE HANDLING AND JOINING

- 1. The contractor is required to transport, handle and store pipe and fittings as recommended by the manufacturer.
- 2. If new pipe and fittings become damaged before or during installation it shall be repaired as recommended by the manufacturer or replaced as required by the engineer at the contractor's expense, before proceeding further.
- 3. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be in strict compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment.
- 4. The butt-fused joint shall be in true alignment and shall have uniform roll-back beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and

shall have tensile strength equal to that of the pipe. All joints shall be subject to acceptance by the engineer and/or his representative prior to insertion. All defective joints shall be cut out and replaced at no cost to the government. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent of the wall thickness shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling as determined by the Contracting Officer or designated representative shall be discarded and not used.

5. Terminal sections of pipe that are joined shall be connected with Central Plastics Electrofusion Couplings, or approved equal, or connectors with tensile strength equivalent to that of the pipe being joined.
6. Service connections with the polyethylene pipe shall be accomplished by the sidewall fusion method in accordance with the manufacturer's printed instructions. All existing service connections shall be reconnected. Contractor shall determine locations of existing service connections prior to construction.
7. Where the polyethylene pipe is connected with ductile iron fittings or valves, an HDPE flange adapter shall be fused to the end of the pipe and the connection made with bolted flange components.
8. All joints shall be inspected by the Contractor Officer's Representative before insertion. The pipe shall be joined on site in appropriate working lengths near the launching pit.

D. LAUNCHING AND RECEIVING PITS

1. The location and number of launching and receiving pits shall be proposed by the contractor and approved by the Government prior to excavation. The pits shall be located such that their number shall be minimized.
2. Before any excavation is done for any purpose, the contractor shall contact the various utility companies for determining field location of existing utilities.

E. INSERTION OF POLYETHYLENE PIPE

1. All buried utilities adjacent to the pipe bursting operation shall be reviewed and where necessary be excavated to relieve transient loading during the insertion operation. If any utilities are within 24" of the pipe to be burst, the contractor shall excavate a pit at the location to check clearance. The amount of clearance will be affected by the soil type, the amount of up-sizing and the location of the existing utility in relation to the line being burst. If adequate separation does not exist between the existing water line and the subject utility, the contractor shall employ substitute means to rehabilitate the existing water line.
2. Any concrete encasements shall be excavated and broken out prior to the bursting operation to allow the steady and free passage of the pipe bursting head. All in-line valves and fittings shall be removed prior to the bursting operation.
3. The new polyethylene pipe shall be inserted immediately behind the bursting head in accordance with the manufacturer's recommended procedures. The bursting equipment

shall be specifically designed and manufactured for the type of insertion process being used.

4. The pipe bursting method shall limit vibrations transmitted to the surrounding soils. The peak particle velocity of ground vibrations resulting from pipe bursting operations shall be limited to 0.5 inches per second.
5. Work necessary to excavate and backfill potholes at utility crossings will not be paid for separately, but will be included in the contract. The surface repair of the potholes is included in the lump sum bid.
6. Work necessary to excavate and backfill appurtenances will not be paid for separately, but will be included in the lump sum contract.

3.3 CLEAN UP

- A. Upon completion of the pipe bursting operations, the Contractor shall restore all areas disturbed by these operations to conditions existing prior to construction. Minimum requirements have been set forth in the drawings and specifications as far as pavement thickness and vegetation.

END OF SECTION